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Natural Resources Department

Estuarine Habitat Assessment for the Nooksack and Lummi Rivers

Melissa Brown, Habitat Biologist

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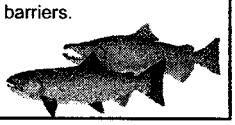
2000: Seattle Corp of Engineers and LNR

Section-22 study that researched the extensive dikes along the Lummi River's banks and at its mouth, and possible restoration alternatives to these salmon habitat-forming barriers.



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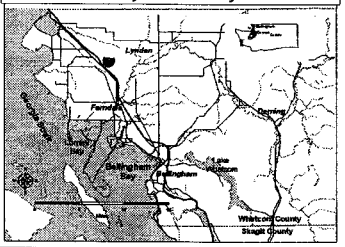
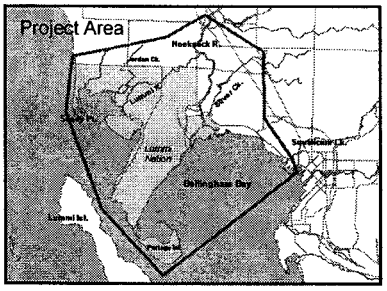
Project Vicinity



Project Area



Fact:

Overall, 70 % of the historic estuary habitat has been lost in the Puget Sound (Bortleson et al. 1980)

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Theory:

Holding times for salmonids in the Nooksack estuary are some of the lowest in the Puget Sound (Sjolseth et al. 1968).

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Hypothesis:

Present conditions within the Nooksack system estuaries are a habitat-limiting factor in salmonid production.

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Hypothesis:

Restoration projects that restore estuary habitat for salmonids will contribute to the recovery of salmon stocks.

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Project Goal One:

Describe the current distribution and condition of habitat in the Nooksack estuary.

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Study Plan:

1. Planform Analysis
2. Channel / Habitat Mapping
3. Longitudinal Profiling
4. Discharge Analysis
5. Salmonid Sampling & Analysis

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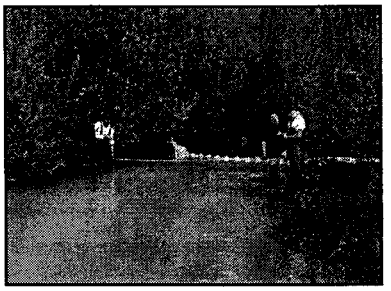

Project Goal Two:

Compare current habitat conditions to past and potential future conditions.

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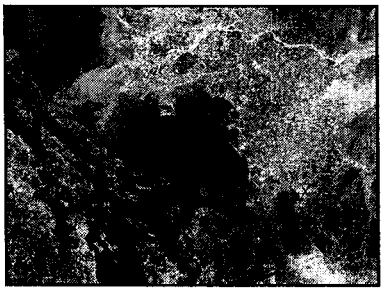
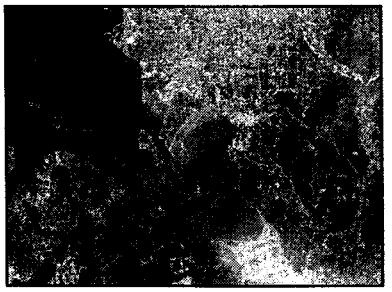
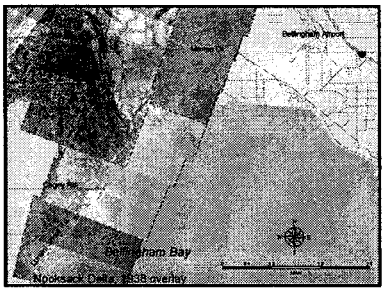
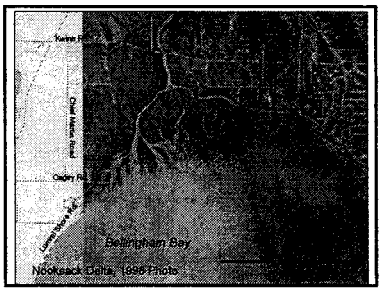
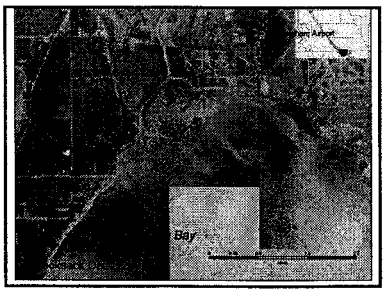
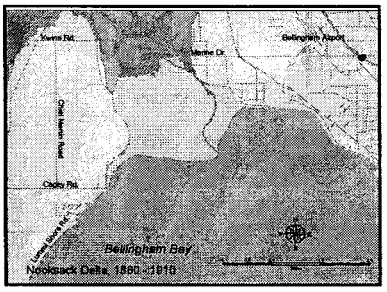


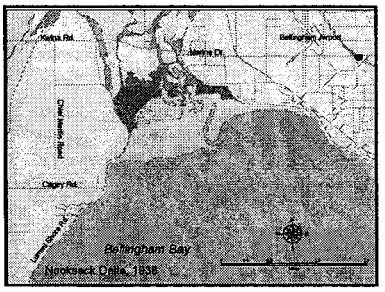


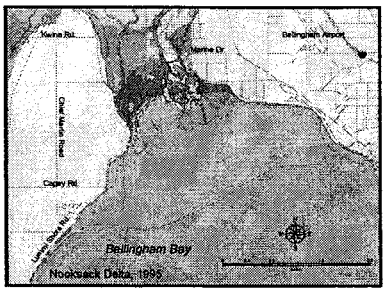


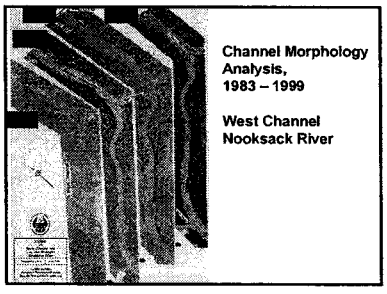






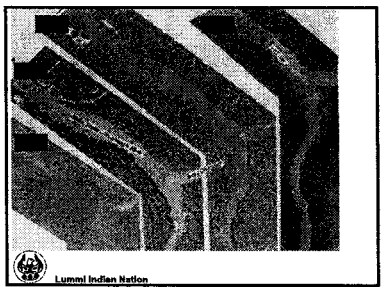






Channel Morphology Analysis, 1983 – 1999

West Channel Nooksack River



Project Goal Three:

Identify anthropomorphic influences in the estuary, and evaluate resulting differences in habitat processes and capacity on a temporal scale.

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Study Parameters

- **Biological**
  Vegetation: Canopy and Submerged; Macroinvertebrates; Fish Species Abundance and Distribution
- **Geomorphic, Geofluvial**
  Channel Typing, Stream Gradient, Discharge Analysis, Floodplain Connectivity

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Study Parameters

- **Chemical (Water Quality)**
- **Physical Attributes**
  Woody Debris, Diked Streambanks, Tidegate and Culvert Locations, Tidal Flux on Available Habitat

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Project Outcomes

- Quantification of estuarine habitat
- Qualitative assessment of the present salmon habitat
- Restoration of estuarine habitat

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Restoration Objectives

- Identify and restore natural processes that create salmonid habitat.
- Provide 30% design on restoration projects.
- Contribute to conditions that support self-sustaining salmon populations.

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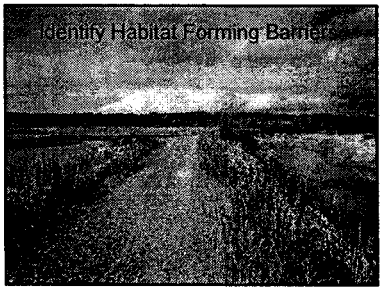

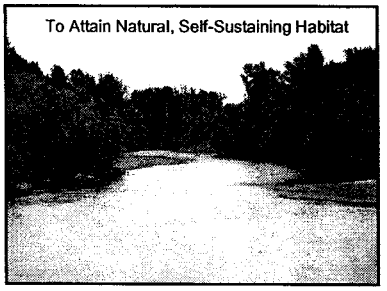

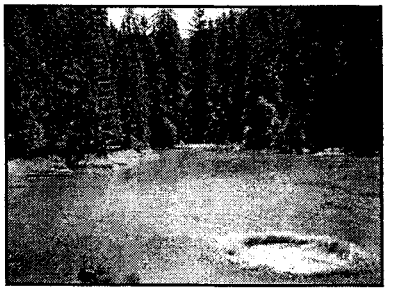

And the Preservation of an Important Resource



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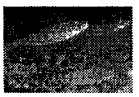
Thank You

- **Willy Lynch, Lummi Nation GIS**
- **Victor Johnson, LNR GIS**
- **Milt Holter, Lummi Nation TFW**
- **DNR Shoreline Projects**
- **Nooksack Tribe Natural Resources**



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